

## Thermodynamics

### Thermal energy

- Total internal energy of particles in a substance (sum of kinetic and potential energies of molecules inside the object)
- Everything with molecules has thermal energy
- More molecules = more thermal energy

### Heat (Q)

- Thermal energy that flows as a result of difference in temperature
- Measured in Joules

### Temperature

- Directly related to the kinetic energy of

molecules

- Average kinetic energy of the molecules
- Does not depend on mass of object
- Measured in Celsius, Fahrenheit, Kelvin

## Kinetic-Molecular Theory

- 1) Matter is made of particles that are constantly in motion
- 2) The amount of kinetic energy in a substance is related to its temperature
- 3) Change of phase may occur when the energy of the particles is changed
- 4) There are spaces between particles
  - a. Solid = least space, gas = most space